a 'fluidisation pipe'.

It is clear that fluidisation pipes point to large-scale rapid geological processes.

First, the sedimentation rate must have been extremely rapid to produce an unconsolidated, water-filled layer of sand at least 5 m thick over a large geographic area. There are many other evidences in the McKay Sandstone that the sedimentation rate was very high, including the occurrence of planar lamination (even in thick-bedded units),[10] metre-scale folding of beds, and large dewatering structures.[11] Rather than millions of years, the sedimentation rate indicates very rapid deposition.

The basalt sill also points to large-scale rapid, catastrophe. The complete thickness of the sill must have intruded quickly over the whole area before the water-logged sediments were able to quench and harden the magma. A thin sill would have been easily quenched, and a slow intrusion rate would have allowed time for the water to start circulating and cool the magma. The entire sill must have been emplaced very quickly before the overlying water had time to boil and establish the strong circulation that fluidised the sand.

And finally, the fluidisation pipes mean that sedimentation and sill emplacement occurred together, indicating that there was virtually no time between the two processes. Thus, fluidisation pipes are one more example of large-scale, watery catastrophe in the geological record.

With such clear evidence of pervasive, inter-woven catastrophe, it is surprising that geologists do not see the implications. Even though they carefully describe the structures and appreciate something of the speed and scale of the processes, they do not realise that the evidence destroys the concept of millions of years. This illustrates how a paradigm can constrain people from seeing the implications of what they observe. The bigger implication, of course, is that the evidence is just what we would expect from the global Flood of the Bible.

Biblical geology is such a refreshing, stimulating, alternative. It breaks open the straight-jacketed thinking of long-age philosophy, and it makes sense of the evidence.

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8. An amygdale is a secondary mineral deposit in an elongated, rounded or almond shaped vesicle in igneous rock, especially basalt.
9. The direction in which a horizontal line can be drawn on a bedding plane.
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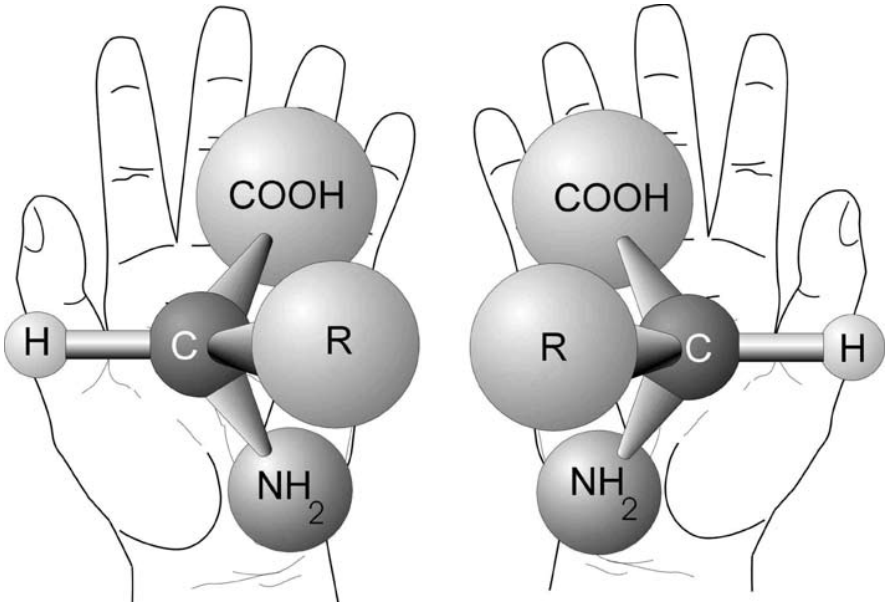
Origin of life and the homochirality problem: is magnetochiral dichroism the solution?

Jonathan Sarfati

A huge barrier for those desiring to *be 'intellectually fulfilled atheists'*[1] is finding a naturalistic origin of the first living organisms. Despite some evasion by major evolutionary propagandists, this is a part of the 'General Theory of Evolution', defined by the evolutionist Kerkut as *'the theory that all the living forms in the world have arisen from a single source which itself came from an inorganic form'*.[2] Indeed, life's alleged origin from lifeless chemicals is commonly called *chemical* or *prebiotic evolution,* or *abiogenesis*. In fact, readers should be aware that most researchers have already presupposed that chemical evolution happened — it must have, because we are here (and don't give me that rubbish about a Designer, because that is not science — regardless of whether the evidence supports it)!

However, because even the simplest self-reproducing organisms are extremely complex,[3] there are enormous hurdles for all chemical evolutionary theories to overcome.[4–8]

One of the major hurdles is the origin of *homochirality*, that is, all the vital biomolecules of life having the same handedness (see figure), e.g. proteins comprise entirely 'left-handed' amino acids, while nucleic acids, starch, glycogen etc. contain sugars that are all 'right handed'. Homochirality is necessary to produce the precise shapes of enzymes and the DNA's double helix. But ordinary chemistry always produces a 50/50 mixture of left and right handed forms (*enantiomers*) — such a mix is called a *racemate* or racemic mixture. Chemists normally require *pre-existing* homochirality, usually from a *biologi-*



Chirality, or handedness, can be defined as the dissymetry where a molecule and its mirror image are not superimposable.

cal source, to synthesise homochiral compounds. But this illustrates the problem of the origin of biological homochirality in the first place.[9]

Magnetochiral dichroism

A recent attempt, by Rikken and Raupach of the Grenoble High Magnetic Field Laboratory, to solve the homochirality problem involves magnetochiral dichroism (MChD).[10,11] This solution had been suggested in 1983 by Wagnière and Meier.[12] Its basis, as with most of the main branches of science, was discovered by creationist scientists,[13,14] in this case, three in the 19th century. In 1846, Faraday rotated the plane of linearly polarised light with a magnetic field parallel to the beam.[15] But Louis Pasteur, the first to resolve a racemic mixture into its *enantiomers* (in 1848), failed in his attempt to use magnetism to grow homochiral crystals.[15] Lord Kelvin,[15] who coined the word *chirality*, pointed out that the magnetic field in itself had no chirality (in the geometrical sense of dissymmetry[9]), as Faraday also realised, unlike Pasteur. Barron showed theoretically that a magnetic field alone cannot produce an enantiomeric excess, and at the time called magnetic optical activity (MOA) *'false chirality'*.[16]

Natural optical activity (NOA), first discovered in 1811 by Arago,[17] results from different interactions of left and right-handed circularly polarised light by dissymmetric molecules. But MOA results from breaking time-reversal symmetry by a magnetic field that induces changes in optical properties of a medium. Barron now suggests extending the definition of chirality to include time-reversal as well as dissymmetry.

In 1982, Wagnière and Meier predicted that a chiral medium would absorb light travelling parallel to a magnetic field differently from light travelling antiparallel[18] — this effect was later named magnetochiral dichroism.[19] It doesn't even require polarized light. The effect was predicted to be very weak, but least weak with rare earth and transition metal ions. So it wasn't till 1997 that Rikken and Raupach observed it in a chiral complex of the rare earth element europium.[20]

Solving the biological homochirality problem?

Because only photons absorbed by a molecule can have any destructive effect, Rikken and Raubach proposed that MChD could induce an enantiomeric excess.[10] They showed this experimentally by irradiating the dissymmetric $[Cr(ox)_3]^{3-}$ (Cr(III) tris-oxalato) complex with laser light in a very powerful magnetic field. In their abstract, they claimed that MChD *'may have played a role in the origin of the homochirality of life.'*[10]

Problems with this solution to the homochirality problem

- There is some similarity with photoresolution by circularly polarised light (CPL). Rikken and Raubach claim that this *'could yield e.e. [enantiomeric excess] close to unity'*.[10] But this is not so for reasons mentioned in Ref. 9, and many of them apply here too. One important factor overlooked is that this hypothetical e.e. of unity would be achieved at an asymptotic point where no material remains.[9]
- Rikken and Raubach[10] hint at problems with MChD resolution, which are similar to those with CPL. For example, magnitude and sign (i.e. right-favouring or left-favouring) of MChD depends on the wavelength of the light. This means that resolution can occur only with light over a narrow wavelength band. Over a broad band, enantioselective effects would cancel. Rikken and Raubach show that the e.e. peaked in the negative with light at 695.5 nm, but peaked in the positive (although only half as much) only 3.5 nm higher.[21] So their best results were using a laser tuned to the optimal wavelength of 695.5 nm, but this is hardly proof that this effect could arise without intelligent input. Only a very narrow 'window of opportunity' was found for a single, carefully selected compound. It is unrealistic to assume the D-enantiomers of *all* 20 essential amino acids and the L-enantiomer of all relevant sugars, including all biological polymers these form, could be eliminated under such narrow constraint.
- Rikken and Raubach[10] agree that

spatial averaging *'needs to be addressed'* as with CPL. That is, it is inevitable that light would come in all directions relative to magnetic flux lines, rather than preferentially aligned parallel to it, so the effect would cancel out. In fact, on a typical planet with a magnetic field and orbiting a star, the light would be mostly perpendicular to the field, which has no effect.

- An extremely strong magnetic field was required, up to 15 T.[22] But Earth's surface field is only 3.1 x 10^{-5} T, and even Jupiter, the planet with the strongest field, has a field of just 4.3 x 10^{-4} T at its equator.[23] Even sunspots, with their intense magnetic fields, go up to 'only' ~4 T. Neutron stars have a magnetic field of 10^{8} T at the surface, but neutron stars are hardly suitable locales for chemical evolution!
- Strong laser irradiation was required — 100 mW tuned to the optimal wavelength absorbed in only 50 ml of solution. This is unacceptable investigator interference for an experiment purporting to demonstrate that homochirality can arise without intelligent input.
- The effect is very weak — the reaction reached equilibrium after about 20 minutes with e.e. peaking at about 1.6 x 10^{-4}, despite the unrealistically high magnetic field and irradiation. Since the slightest deviation of e.e. from unity is catastrophic for biological molecules, MChD hardly even makes a dent. Whether any e.e. at all would be detectable for biologically relevant building blocks remains to be determined.
- The complex begins to racemize after stopping irradiation, with a time constant[24] of 70 minutes. So even under optimal conditions for producing the tiny e.e., the weak chirality is unlikely to last long enough to influence any biologically relevant molecules. Although many evolutionists appeal to long ages to solve all their problems, in reality long ages would mean more time for degradation.

Discussion and conclusion

The experiment is great experimental chemistry, but as usual, the difference between creationists and evolutionists is not the data, but their *interpretation*, because of their different presuppositions. Creationists dispute no *observations* by evolutionists, but often vigorously oppose the conclusions evolutionists draw from the observations. So here, a creationist would *interpret* the *observation* of enantioselective magnetichiral photochemistry as showing once again that the homochirality problem for chemical evolution is still unsolved. As shown, this caution is amply justified by the problems involved, some of which were commendably admitted by the authors. In their concluding comments, Rikken and Raupach admit (contrary to their optimistic abstract): *'Clearly the question of the origin of the homochirality of life is far from answered.'*

But will the insuperable barriers against chemical evolution make atheists abandon their faith? Most unlikely, given the amount of research funding spent on chemical evolutionary experiments. It must be noted that atheists have a form of presuppositionalism, although it is misguided and baseless, while biblical presuppositionalism is firmly grounded on the Bible's self-consistency and the teachings of Christ. Yet evolutionists frequently chide creationists for not abandoning their beliefs because of some supposedly irrefutable proof of evolution or argument against a 'young' earth and global flood. Even worse, many Christian leaders 're-interpret' Genesis to fit theistic evolutionary or other 'billions-of-years' views simply because they have no immediate answers to apparent problems with the straightforward meaning.

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Sloppy science

'Moreover, in evolutionary biology there is little payoff in repeating other people's experiments, and, unlike molecular biology, *our field is not self-correcting* because few studies depend on the accuracy of earlier ones.'

Coyne, J.A., 1998.
Not black and white.
Nature **396**(6706)35–36
(quote on p. 36, emphasis added).

Evolutionary professor encourages critical thinking

Michael J. Oard

An interesting opinion article appeared in a recent issue of *Physics Today*, entitled *Teaching and Propaganda*.[1] Motivated by the 1999 Kansas Board of Education decision and the outcry by scientists, Mano Singham is a voice of reason within an irrational overreaction.

Although he makes it clear that he is not a closet creationist (a statement many evolutions feel obligated to make — likely to avoid ridicule for daring to criticize evolution), he goes on to cheer those students in his physics classes that have been skeptical enough to question some of the doctrines being taught. He admits that teaching is really *brainwashing* because the students trust the teacher, the institution, and the school that granted the degree that allows one to teach. He admits:

> *'And I use that trust to effectively brainwash them. We who teach introductory physics have to acknowledge, if we are honest with our selves, that our teaching methods are primarily those of propaganda. We appeal — without demonstration — to evidence that support our position. We only introduce arguments or evidence that support the currently accepted theories, and omit or gloss over any evidence to the contrary. We give short shrift to alternatives theories, introducing them only in order to promptly demolish them — again by appealing to undemonstrated counter-evidence.'* [2]

Most professors prefer these 'good' trusting students. However, he is bothered by this type of student, who seems to readily accept almost anything. The danger is that these students can believe anything from some other 'expert' or ideologue, which can be dangerous. He marvels at their easy acceptance of relativity and quantum mechanics upon first hearing, in spite of these concepts being so contrary to everyday experience. Unfortunately, he also gives creationists dishonourable mention as those 'other propagandists'. Nevertheless, his point is well taken, and he prefers the student who thinks for themself and weighs arguments, even if that student is a creationist.

However, Professor Singham justifies the brainwashing because of practical considerations, such as 'not enough time to develop all the arguments', or that he wants his students to be accepted as 'modern' people. He considers he has the best of intentions for his students:

> *' ... of course we do all this [brainwashing] with the best of intentions and complete sincerity. I have good reasons for employing propaganda techniques to achieve belief.'* [2]

Obviously, he believes he is imparting truth to the students, which justifies the means. I would not mind if he stuck only to observational physics, but when he applies this same attitude to historical science, he is too trusting and lacks critical thinking himself. But still, he prefers critical thinking students:

> *'The best I can hope for is to enable my students to think critically, to detect propaganda and reject intellectual coercion, even when I am the one doing it.'* [3]

I am grateful to Professor Singham for his candidness and for allowing dissent by creationist students. I now look forward to the time when he can apply this critical thinking to his own evolutionary assumptions and worldview.

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